BRAINS, PEOPLE AND POLITICS:

Future directions in neuroscience

Rosemary Du Plessis, School of Sociology and Anthropology, University of Canterbury

This paper is a commentary on
"Future Directions in Neuroscience: A twenty year timescale"
A briefing paper prepared for the New Zealand Navigator Network
By Steven P.R. Rose
Professor Emeritus Open University

Presented at
"Unfolding the Mind: prospects and perils in neuroscience"
a national symposium held in Auckland New Zealand
9 March 2007
All papers are available at www.navigatornetwork.net.nz

Picking up the spectacles/framing

I respond to Steven Rose's considered and comprehensive discussion of developments in neuroscience and the issues they pose primarily as a sociologist. This has some advantages and many limitations – not least deficiencies in my knowledge of neuroscience. Sociologists are trained to seek social explanations for human behaviours through attention to 'the social' – the operation of formal and informal power, the creation and circulation of things, images and social meanings, interpersonal relationships, formal and informal rules etc.. Sociologists are more comfortable discussing the demographic distribution of types of mental illness than levels of serotonin and dopamine in the brains of those diagnosed with depression, bi-polar disorder or schizophrenia. Sociologists enjoy questioning what others 'black box' or take for granted, but often ignore their own black boxes, including the interface between behaviour and neurological functioning. Developments in neuroscience push us to crank open the lid of that black box, encounter the discomforts of the new and grapple with the challenges of understanding the interaction between the social and chemical, electrical, hormonal and genetic manifestations of human beings.

Sociologists do not have obvious, straight forward, easily accessed forms of expertise to bring to the discussion of neuroscience. What they have is some ways of framing issues which might be useful to others interested in discussing the implications of the combination of knowledges, techniques, ways of imaging brain and nervous system functioning that are referred to as neuroscience. In this commentary, I apply my sociologically tinted glasses to some of the issues raised by Steven Rose but start and end with consideration of the contributions at a more general level of anther Rose, Nikolas Rose, a British sociologist, who, like many sociologists, addresses some core issues relating to power, politics and social change. In a recent book, entitled *The Politics of Life Itself*, he turns his attention to biomedicine, power and subjectivity in the twenty-first century.

According to Nikolas Rose (2007:3), the politics of life itself is 'concerned with our growing capacities to control, manage, engineer, reshape, and modulate the very vital capacities of human beings as living creatures.' This politics manifests itself in new forms of regulation and decision-making and new institutional forms charged with responsibility to engage citizens and provide advice to governments (like the UK Human Genetics Commission and Toi te Taiao/ the Bioethics Council. This politics also entails new forms of self understanding and self governance. As new science provides new information about us as 'somatic' or embodied individuals, Rose (2007:223) argues that people will be expected to assume new responsibilities for controlling their potentially errant bodies or the bodies or potential bodies of their children. They will in this way exercise disciplined 'biological citizenship'. Nikolas Rose tends to identify biological citizenship and self consciously somatic individuals as a uniquely 21st century phenomenon – a feature of 'the biotech century'. In my view, this tends to neglect three decades of contemporary feminist intellectual and activist attention to the politics of gendered bodies, their external discipline and self discipline. However, any assessment of the implications of contemporary neuroscience does require attention to the politics of life itself, selves, collectivities and biological citizenship and I will return to a discussion of Rose's key concepts and their relevance at the end of this commentary.

The politics of boundaries and interdisciplinary

Sociologists have long been interested in the social construction of knowledge. This includes attention to the social processes involved in constructing disciplinary boundaries. For sociologists, nanotechnologies and the neurosciences are intrinsically interesting because they challenge established disciplinary boundaries. How do research institutions encourage the collaborations across disciplinary boundaries that this new science entails? Who leads the research teams? How do those in different disciplines share knowledge and interpret data? What translations occur between those steeped in different disciplinary languages? How are resources for research distributed between those in different disciplines? And how do external funders respond to research proposals that make claims for a multiplicity of disciplinary input? These are questions that those in research institutions in Aotearoa New Zealand and elsewhere have been facing, and will increasingly need to answer in the next twenty years.

Steven Rose (2006:14-18) indicates that neuroscience is empirically rich, but theoretically poor. A sociologist would look for the social, cultural and organizational reasons for this. How do the social relationships of scientific production contribute to this situation? And how might different sets of contacts among those with an interest in neuroscience, including philosophers, ethicists, lawyers and social scientists contribute to a rich, lively body of theory? What has been learnt in the context of exploring science and technology issues in Aotearoa New Zealand and elsewhere in the last few years, especially since the disruptive and polarized debate about the use of genetic modification technologies, is the need for research teams working in the frontiers of science to incorporate a variety of different knowledge systems, including those available from the social sciences and humanities. Will the recognition of the brain as 'an open dynamic system', as Rose (2006: 39) indicates, facilitate attention to social and cultural environments and the blurring of boundaries between the biological, social and human sciences? Is a small society like Aotearoa New Zealand perhaps better

positioned to respond to these boundary blurring challenges than contexts in which there are higher concentrations of those with expertise in particular fields?

The politics of explanation

Social scientists, including sociologists, have often been critical of explanations in the biological sciences that focus exclusively on a single explanatory factor such as genes or hormones. At the same time, social scientists may engage in social reductionism seeking to explain some facet of human behaviour in terms of a single facet of the social environment. The technologies of brain imaging associated with neuroscience push social scientists to open the black box and develop analyses that explore the dynamic interactions of human physiology and social environments. However, it is important that attention to the dynamics of brain functioning do not inhibit analyses of disorders such as attention deficit hyperactivity disorder as social phenomena that come to be defined and treated at particular periods of time in specific contexts. To do this they need to look at the relationships between research scientists, clinicians, drug companies and agencies like NZ's Pharmac that approve the purchase of drugs for particular conditions. We also need to examine the development and circulation of the social meanings attached to diagnoses like ADHD.

Just as developments in neuroscience depend on transdisciplinary collaboration, so too will thoughtful application of this knowledge and consideration of its relationship to other sources of information. This will entail the 'cognitive pluralism' advocated by the philosopher, Mary Midgley (2004) who argues that all explanation, and particularly the explanation of human action, requires different but convergent approaches in response to questions from those located in very positions. The organisation of this workshop is an example of a commitment to that cognitive pluralism.

The significance of context

Sociologists have often been drawn to making large scale generalizations about power, social change and the basis for order in human societies. The best sociology, however, focuses on the significance of context – the significance of historical time, geographical, economic, and political environments. The development of neuroscience is an example of the globalization of knowledge which has been occurring ever since humans migrated across the surface of the earth on foot, in canoes, by train, by ship and by plane. In the last few decades the globalization of knowledge has been intensified through innovation in computer and communication technologies. At the same time, analysis of globalization has highlighted the significance of the local and the specific.

Developments in neuroscience will have different effects in different national and even regional contexts. In a health system with mixed public/private delivery of diagnosis, treatment and access to pharmaceuticals, not everyone will have the same access to either the potential treatments or enhancement associated with the new knowledge generated by neuroscientists. In a nation state founded on a commitment to partnership with Maori as the indigenous people of Aotearoa New Zealand, there are also some specific ways in which we will need to give consideration to the implications for us as individuals, as communities and as citizens of developments in neuroscience. Maori participants in a recent project that explored some of the social, cultural, ethical and

spiritual implications of genetic testing and biobanking were interested in the health applications of genetic science, but concerned about potential disruption to whakapapa posed by the use of genetic information and possible treatment of genetic mutations (Du Plessis et al, 2004, 15-16). In the context of this nation state developments in neuroscience and their applications will need to be discussed with diverse Maori individuals and communities. In a country that is increasingly varied in its composition with respect of countries of origin or descent, there will also be a need for a range of strategies for public engagement in discussion about how the findings of neuroscience might be applied in Aotearoa New Zealand.

Research conducted by the Constructive Conversations/Korero Whakaaetanga research programme relating to genetic testing indicated that members of community groups included in that study were sometimes cautious about the value of access to information about one's DNA, but strongly argued that, if it was beneficial, these benefits should not be limited to those with the ability to pay (Du Plessis et al, 2004: 24). It is likely that they would have similar responses to citizen's access to diagnosis or treatment informed by the latest findings of neuroscience. At the same time, the participants in this study were concerned about the costs of technologies associated with developments in genetics (and potentially neuroscience). They raised questions about how resources for immunization programmes, breast screening, glue ear and hip replacements might be threatened by diagnostic and treatment services associated with new genetic medicine (Du Plessis, et al, 2004: 24). These are important issues for public consideration as neuroscience develops. What will it cost? Who will pay for it? Will there extra resources be shifted from central government to District Health Boards to meet these costs? Or will the effects of using this knowledge be cost neutral? And how will these costs be calculated and communicated to interested members of the public?

These questions raise issues about how those other than scientists, clinicians and policy makers can be involved in decision-making about investment in, and the application of new scientific and technological knowledge.

Where do people fit in? The politics of public engagement

Steven Rose (2006: 2) suggests that developments in neuroscience raise issues that require 'the development of new modes of public engagement in their upstream management'. His recommendation is consistent with the findings of a recent evaluation of a number of projects directed at experimenting with strategies for public engagement in Aotearoa New Zealand. The key strategies for good public engagement with science and technology were identified as setting up opportunities for change not just doing the talk, honing the skills that might be used in ongoing dialogue with scientists or technologists, culturally appropriate, and initiated early in the design of new projects (Winstanley et al, 2005). People needed to have the opportunity to step out of old ways of doing things, while also feeling welcomed and sharing food. Clear expectations of the event and the chance to be heard and to articulate differences were very important as well as activities that led to cumulative understandings and forms of interaction with other participants. Overall, people enjoyed the stimulation of hearing positions other than their own and indicated that they embraced opportunities for connection across differences (Cronin and Jackson, 2004; Tanner and Skipper, 2004).

Knowledge of Tikanga Maori was important if interactions between scientists and technologists and Maori participants were to be productive. It was particularly important to Maori that the people in dialogue with them were known and trusted rather than people they were meeting for the first time (Winstanley et al, 2005: 6). There were concerns about whether funding for research adequately addressed the need for researchers to meet with relevant members of the public to discuss the implications of their work and seek public input into issues associated with it.

Against the background of recent experimentation with strategies for involving diverse publics in discussion of controversial science and technology issues, engagement relating to the neurosciences can build on what has already been learned. In the last decade the New Zealand Royal Commission on Genetic Modification, the Bioethics Council, the Parliamentary Commissioner for the Environment, Landcare Research and a range of researchers located in other Crown Research Institutes, private research agencies or universities and polytechnics have engaged in experimentation with forms of engagement starting with attempts to implement the Danish consensus conference model at the Talking Plant Technology consensus conference – an experiment that has been critically evaluated by political scientist, Joanna Goven (Goven, 2003).

Some of the public engagement strategies have focused on how Maori can best be drawn into such conversations and/or how Maori traditional customs for facilitating conversation or korero can be incorporated into engagement that involves both Maori and non-Maori (Lyver et al, 2004; Tanner, 2004, Tipene-Matua and Phillips, 2005). Just as there will be new developments in neuroscience, so there will be new developments in forms of public engagement with different publics especially new immigrants. But the groundwork has been done, often by researchers, communicators and facilitators of different ethnicities with diverse disciplinary backgrounds. Some of this engagement has been 'upstream' public engagement in the sense that it has been done before key decisions have been made, legislation passed or guidelines developed. On the other hand, the outcomes of some of these experiments in engagement have not always had the effect on the application of science that some participants envisaged. The issue may not just be effective and appropriate strategies for engagement, but the possibility that this engagement does effectively shape decision-making.

Selves, bodies and 'the politics of life itself'

What are the implications for people as selves, bodies and citizens of current developments in neuroscience? Media accounts of new knowledge in genetics and neuroscience suggest that processes invisible to us associated with our genes, our neurotransmitters or electrical activity in our brains have an impact on how we behave and our emotions. This occurs in a context in which people are frequently encouraged to engage in processes of rectification (to be fitter, thinner, more energetic as well as more physically attractive). The project of 'the self' is significantly an embodied project in which a variety of different technologies (low fat diets, exercise machines, pedometers, and psychotherapeutic drugs) are incorporated into everyday practices in Aotearoa and other industrialized liberal democratic economies. Nikolas Rose's 'somatic' individuals (Rose, 2007: 26-27, 188) are not uniquely products of new biotechnologies. These scientific developments need to be seen in the context of the global economy in which they are located where money is constantly to be made through the development and sale of things like self-tanning products, Viagra, Ritalin, Hercepton and titanium hip

joints. These economic networks co-evolve with ideas about how life might be prolonged and enhanced for individuals with the capacity to pay for new technologies of the body, or private insurers or nation states with the capacity to underwrite access by groups of people to these technologies. People in relatively prosperous nation states will attempt to craft their neurological somatic selves (and potentially their children) in the context of these broader issues about bodies, selves and the resources to pursue projects of the self. In other contexts, the application of the physical and social sciences to AIDS, malaria, glaucoma, food scarcity and gastroenteritis may be much more pressing.

In Aotearoa New Zealand and elsewhere citizens have yet to have a thorough discussion of whether they think that implanted electronic arrays or direct brain computer interfaces are significantly different to pace makers and hip and knee joints and need to be subjected to special scrutiny. They have also yet to talk about their responses to the allocation of public funding to potentially highly expensive interventions that make possible both rectification and enhancement of human cognitive functioning. Biological citizenship will potentially not just involve self-governance using a variety of old and new technologies for controlling, reshaping and modifying brains and other aspects of human bodies, but some collective attention to the issues Steven Rose (2006: 39 – 41) eloquently raises in his reflections on future directions in neuroscience. Decision-makers in Aotearoa New Zealand will have to consider whether the availability of resources for future work in neuroscience needs to go hand in hand with resources for 'upstream' discussion among different publics about what we want to know about brain functioning, its relationship to other aspects of our physiology, and how the knowledge generated through the neurosciences might be used.

References

Cronin, K. and Jackson, L. (2004) *Hands Across the Water. Developing dialogue between stakeholders in the New Zealand biotechnology debate*. MoRST Dialogue Fund Final Report, School of Earth Sciences, Victoria University of Wellington.

Du Plessis, R. et al (2004) *The Social, Cultural, Ethical and Spiritual Implications of Genetic Testing: Preliminary Findings*. Research Report no. 3, Constructive Conversations/Korero Whakaaetanga Research Programme, Social Science Research Centre, University of Canterbury.

Goven, J. (2003) Deploying the consensus conference in New Zealand: democracy and de-problematisation. *Public Understanding of Science*, 12: 4, pp. 423-440.

Lyver, P. et al (2004) *A Process for Enhancing Dialogue on Biosecurity Issues*. MoRST Dialogue Fund Final Report, Landcare Research.

Midgley, Mary (2004) 'Do we ever really act? In Dai Rees and Steven Rose (eds) *The New Brain Science: Perils and Prospects*, Cambridge: Cambridge University Press, pp.17-33.

Roper, J. et al (2004) *Science Dialogues: The Communicative Properties of Science and Technology Dialogue,* MoRST Dialogue Fund Final Report, Department of Management Communication, University of Waikato.

Rose, Nikolas (2007) *The Politics of Life Itself: Biomedicine, Power and Subjectivity in the Twenty-First Century*, Princeton: Princeton University Press.

Rose, Steven (2006) Future Directions in Neuroscience: a twenty year timescale. Briefing prepared for the New Zealand Navigator Network.

Tanner, C. and Skipper, A. (2004) *Finding Common Ground – Improved wastewater management systems that address Maori cultural and spiritual values*, MoRST Dialogue Fund Final Report, National Water and Atmospheric Institute (NIWA) Hamilton.

Tipene-Matua, B. (2006) Having honest conversations about the impact of new technologies on indigenous people's knowledge and values. *Matauranga Taketake: Traditional Knowledge Conference, Indigenous Indicators of Well-being, Perspectives, Practices, Solutions.* Constructive Conversations/Korero Whakaaetanga Research Programme.

Winstanley, A. et al (2005) *From 'dialogue' to 'engagement' Learning beyond Cases.* Cross Case Study Learning Group report to the Ministry for Research, Science and Technology on the Dialogue Fund Projects.